Xeroderma Pigmentosum, Complementation Group A

**Alternative Names**
XPA  
XP Group A  
Xeroderma Pigmentosum I  
XP1  
XPA Correcting  
XPA Complementing  
XPAC  
XPA Gene

**WHO International Classification of Diseases**
Congenital malformations, deformations and chromosomal abnormalities

**OMIM Number**
278700

**Mode of Inheritance**
Autosomal recessive

**Gene Map Locus**
9q22.3

**Description**
Xeroderma pigmentosum is a very rare autosomal recessive skin disorder characterized by photosensitivity, poikilodermic changes predominantly of the light-exposed skin with early aging of the skin and a high incidence of malignant neoplasia of the skin.

Neuroendocrinal and metabolic errors are the frequent associations but the most serious hazard is the liability towards malignant cutaneous growths very early in life which may be responsible for life termination in the first or second decades. Xeroderma pigmentosum has been associated with several forms of skin cancer, and, in some cases, may occur along with dwarfism, mental retardation, and/or delayed development.

Xeroderma pigmentosum has been reported to be unusually frequent among Arab populations.

**Molecular Genetics**
Xeroderma pigmentosum complementation group A is caused by mutation in the XPA gene, located on human chromosome 9q. The XPA gene codes for an mRNA of about 1 kb, corresponding to a hydrophilic protein of 273 amino acids, with a relative molecular mass of 31,000. Its distinct zinc finger motif indicates that it interacts directly with DNA, presumably as part of an enzyme complex that makes an incision near damaged sites.

**Epidemiology in the Arab World**

**Egypt**
El-Hefnawi and Smith (1965) and El-Hefnawi et al. (1965) presented useful Egyptian pedigrees, possibly of complementation groups A and C, and suggested linkage with the ABO blood group locus. Bootsma and Keijzer (1979) studied eight patients from six Egyptian families. Three were assigned to complementation group A and five to group C.

Hashem et al. (1980) conducted a survey of DNA repair characteristics among Egyptians with xeroderma pigmentosum. Out of 16 XP patients, biopsies from eight were analyzed for unscheduled DNA synthesis, strand breakage during pyrimidine dimer excision, and complementation groups. The patients were equally distributed between Complementation Groups A and C. Unscheduled synthesis and strand breaks were significantly higher in Group C than in Group A cells. Central nervous system disorders were found in all of the Group A patients and in none of the Group C patients. No clinical symptoms were observed in the heterozygotes. A 2-month-old sib of an XP patient was free of symptoms, but unscheduled synthesis and strand breakage in cultures from this sib were the same as in the related XP homozygote.
Palestine
Satokata et al. (1992) studied the molecular basis of xeroderma pigmentosum in a Palestinian patient with severe symptoms of XP. The patient was found homozygous for a nucleotide transition altering the Arg-207 codon (CGA) to a nonsense codon (TGA).

Tunisia
Giraldo et al. (1977) performed HLA-A and -B typing on peripheral blood lymphocytes and platelets in 37 patients and 108 relatives from 16 Tunisian families. Comparison of HLA gene frequencies between (unrelated) parents of patients and a control population showed no difference, proving that there is no clear association in populations between deleterious XP genes and a particular HLA gene. However, an excess of identical HLA among pairs of diseased siblings would suggest that the disease is polymorphic and a form of the XP could be linked to HLA.

United Arab Emirates
Acharya and Al Rubai (1987) reported two sibs (one male and one female), nationals of the United Arab Emirates, with xeroderma pigmentosum. The parents were consanguineous. The male patient revealed multiple lentigines and hyper-pigmented cutaneous macules with atrophic areas and telangiectasia producing a poikilodermatous appearance of the skin mainly on the face, neck, V-shaped areas of chest, ears, hands, forearms, legs, and lower part of the thighs. Examination of the eyes showed conjunctivitis, keratitis, and corneal opacities. The 4-year-old sister had a complaint of photosensitivity and photophobia since birth, and was also mentally retarded. Examination revealed mild to moderate hyperpigmented cutaneous macules with atrophic areas and telangiectasia on the face, neck, V-shaped areas of chest with few hyperpigmented lesions on hands, forearms, and legs. Karotyping in both sibs was normal. In 1990, Al Rubaie and El Darouti reviewed the cases of seven patients with xeroderma pigmentosum. In one case, abnormal karyotyping was suggestive of an increased risk of the development of neoplasia.

References

Contributors
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